Practice: 587 - Structure for Water Control

Scenario: #1 - Inline Stoplog WCS, Surface Water Control, 6-10 in. dia. Pipe

Scenario Description:

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 12", height of six feet, The pipe is 65' of 8" SCH 40 PVC (inlet and outlet combined).

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $2,683.86 **Scenario Cost/Unit:** $2,683.86

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$58.80	2	$117.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.23	55	$287.65
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$27.55	2	$55.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	8	$178.48
Materials						
Pipe, PVC, 8", SCH 40	981	Materials: - 8" - PVC - SCH 40 - ASTM D1785	Foot	$9.72	65	$631.80
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport	Pound	$2.34	40	$93.60
Steel, Plate, ⅛"	1047	Flat Steel Plate, ⅛" thick, materials only.	Square Foot	$4.65	36	$167.40
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	$309.67	1	$309.67
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$11.96	48	$574.08
Mobilization						

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$268.48	1	$268.48

Practice: 587 - Structure for Water Control

Scenario: #2 - Inline Stoplog WCS, Surface Water Control, 12-18 in. dia. Pipe

Scenario Description:

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 20", height of six feet, The pipe is 65' of 15" SDR35 PVC (inlet and outlet combined).

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Number of Structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $3,616.08 **Scenario Cost/Unit:** $3,616.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$58.80	2	$117.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.23	55	$287.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	8	$178.48
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$27.55	2	$55.10
Materials						
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport	Pound	$2.34	80	$187.20
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$11.96	90	$1,076.40
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	$309.67	1	$309.67
Pipe, PVC, 15", SDR 35	1722	Materials: 15" - PVC - SDR35 - ASTM D3034	Foot	$14.06	65	$913.90
Steel, Plate, ⅛"	1047	Flat Steel Plate, ⅛" thick, materials only.	Square Foot	$4.65	36	$167.40

Materials

Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$13.55	4	$54.20

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$268.48	1	$268.48

Practice: 587 - Structure for Water Control

Scenario: #3 - Inline Stoplog WCS, Surface Water Control, >18 in. dia. Pipe

Scenario Description:

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 31", height of six feet, The pipe is 65' of 24" used steel (inlet and outlet combined).

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $7,186.72 **Scenario Cost/Unit:** $7,186.72

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.23	55	$287.65
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$58.80	2	$117.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	8	$178.48
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$33.95	10	$339.50
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$27.55	2	$55.10
Materials						
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	$309.67	1	$309.67
Steel, Plate, ⅛"	1047	Flat Steel Plate, ⅛" thick, materials only.	Square Foot	$4.65	49	$227.85
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$11.96	144	$1,722.24
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$13.55	8	$108.40
Pipe, Steel, 24", Std Wt, USED	1360	Materials: - USED - 24" - Steel Std Wt	Foot	$49.37	65	$3,209.05

Materials

Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport	Pound	$2.34	155	$362.70

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$268.48	1	$268.48

Practice: 587 - Structure for Water Control

Scenario: #4 - Weir Box Inlet WCS, Surface Water Control, <=16 in. dia. Pipe.

Scenario Description:

A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A fabricated weir box structure with a pipe of 16" diameter or less is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, flap gate and weir box structure.

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A weir box structure is placed in a levee to manage water level elevation. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $3,856.65 **Scenario Cost/Unit:** $3,856.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$58.80	2	$117.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.23	55	$287.65
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$27.55	2	$55.10
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$33.95	8	$271.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	8	$178.48
Materials						
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport	Pound	$2.34	82	$191.88
Steel, Angle, 3" x 3" x 1/4"	1372	Materials: Angle, 3" x 3" x 1/4", Meets ASTM A36	Foot	$3.42	30	$102.60
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$13.55	4	$54.20
Pipe, Steel, 16", Std Wt, USED	1357	Materials: - USED - 16" - Steel Std Wt	Foot	$28.89	65	$1,877.85
Steel, Plate, ⅛"	1047	Flat Steel Plate, ⅛" thick, materials only.	Square Foot	$4.65	49	$227.85
Steel, Plate, 3/16"	1048	Flat Steel Plate, 3/16" thick, materials only.	Square Foot	$6.98	32	$223.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$268.48	1	$268.48

Practice: 587 - Structure for Water Control

Scenario: #5 - Weir Box Inlet WCS, Surface Water Control, >16 in. dia. Pipe.

Scenario Description:

A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A fabricated weir box structure with a pipe of greater than 16" diameter is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, flap gate and weir box structure.

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A weir box structure is placed in a levee to manage water level elevation. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $5,386.37 **Scenario Cost/Unit:** $5,386.37

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.23	55	$287.65
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$58.80	2	$117.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$27.55	2	$55.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	8	$178.48
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$33.95	9	$305.55
Materials						
Steel, Plate, 3/16"	1048	Flat Steel Plate, 3/16" thick, materials only.	Square Foot	$6.98	32	$223.36
Steel, Plate, ⅛"	1047	Flat Steel Plate, ⅛" thick, materials only.	Square Foot	$4.65	36	$167.40
Pipe, Steel, 24", Std Wt, USED	1360	Materials: - USED - 24" - Steel Std Wt	Foot	$49.37	65	$3,209.05
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$13.55	8	$108.40
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport	Pound	$2.34	155	$362.70
Steel, Angle, 3" x 3" x 1/4"	1372	Materials: Angle, 3" x 3" x 1/4", Meets ASTM A36	Foot	$3.42	30	$102.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$268.48	1	$268.48

Practice: 587 - Structure for Water Control

Scenario: #6 - Weir Box Inlet WCS, Surface Water Control Using Existing Pipe (Box Only)

Scenario Description:

A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A fabricated weir box structure is installed on existing piping.

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A weir box structure is placed in a levee over an existing subsurface system to manage water level elevation. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $584.44 **Scenario Cost/Unit:** $584.44

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$39.03	2	$78.06
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$33.95	4	$135.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	2	$44.62
Materials						
Steel, Plate, 3/16"	1048	Flat Steel Plate, 3/16" thick, materials only.	Square Foot	$6.98	32	$223.36
Steel, Angle, 3" x 3" x 1/4"	1372	Materials: Angle, 3" x 3" x 1/4", Meets ASTM A36	Foot	$3.42	30	$102.60

Practice: 587 - Structure for Water Control

Scenario: #7 - Watertight Flapgate Inflow WCS, Surface Water Control, <=15 in. dia. Pipe

Scenario Description:

A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A Flap/Slide Gate with a pipe of 15" diameter or less is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, and flap gate.

Before Situation:

A wetland or other area is in need of a flap gate to control the flow of water through a pipe to provide habitat for fish and wildlife. The landowner wishes to provide a way for water to flow into a managed wetland pool yet automatically prevent flow from leaving the pool when the water source inflow head becomes less than the pool head.

After Situation:

A WCS pipe with flap gate 15" or less in diameter is installed. The pipe is installed through a water management embankment allowing shallow water impoundments to take on water from a higher elevation such as floodwater. When the surface of the inflow water source drops to an elevation that is lower than the wetland pool water surface, the flap gate automatically closes, preventing the loss of water from the wetland area. A wetland area is enhanced by having the ability to automatically fill with water when the hydrologic opportunity presents itself to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $2,577.93 **Scenario Cost/Unit:** $2,577.93

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$58.80	6	$352.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	12	$267.72
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$33.95	4	$135.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$27.55	6	$165.30
Materials						
Pipe, PVC, 15", SDR 35	1722	Materials: 15" - PVC - SDR35 - ASTM D3034	Foot	$14.06	65	$913.90
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$13.55	4	$54.20
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport	Pound	$2.34	82	$191.88
Steel, Plate, ⅛"	1047	Flat Steel Plate, ⅛" thick, materials only.	Square Foot	$4.65	49	$227.85
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$268.48	1	$268.48

Practice: 587 - Structure for Water Control

Scenario: #8 - Watertight Flapgate Inflow WCS, Surface Water Control, >15 in. dia. Pipe

Scenario Description:

A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A Flap/Slide Gate with a pipe of greater than 15" diameter is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, and flap gate.

Before Situation:

A wetland or other area is in need of a flap gate to control the flow of water through a pipe to provide habitat for fish and wildlife. The landowner wishes to provide a way for water to flow into a managed wetland pool yet automatically prevent flow from leaving the pool when the water source inflow head becomes less than the pool head.

After Situation:

A WCS pipe with flap gate greater than 15" in diameter is installed. The pipe is installed through a water management embankment allowing shallow water impoundments to take on water from a higher elevation such as floodwater. When the surface of the inflow water source drops to an elevation that is lower than the wetland pool water surface, the flap gate automatically closes, preventing the loss of water from the wetland area. A wetland area is enhanced by having the ability to automatically fill with water when the hydrologic opportunity presents itself to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $4,076.45 **Scenario Cost/Unit:** $4,076.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$58.80	6	$352.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	12	$267.72
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$33.95	5	$169.75
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$27.55	6	$165.30
Materials						
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	$13.55	8	$108.40
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport	Pound	$2.34	155	$362.70
Pipe, PVC, 24", PS 46	1254	Pipe, PVC, PS 46, 24" Diameter - ASTM F679. Material cost only.	Each	$33.13	65	$2,153.45
Steel, Plate, ⅛"	1047	Flat Steel Plate, ⅛" thick, materials only.	Square Foot	$4.65	49	$227.85
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$268.48	1	$268.48

Practice: 587 - Structure for Water Control

Scenario: #9 - Inline WCS, Subsurface Drainage Control, <=10 in. dia. Pipe

Scenario Description:

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through a control structure which is operated with stoplogs. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil. This retention time allows nutrients to be reduced by bacteria such that the nutrients do not leave with the water. A single stoplog structure may have its influence extended by buried float-activated structures which can be counted as structures also for a separate payment. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

Before Situation:

The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

After Situation:

The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile removes nutrients. Typical affected area for a single structure is 10-20 acres. A single structure with stoplogs may have its influence extended by use of buried float-activated control structures, which may be paid for as separate structures also.

Scenario Feature Measure: Number of Structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $1,663.53 **Scenario Cost/Unit:** $1,663.53

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$58.80	3	$176.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$36.46	3	$109.38
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	2	$44.62
Materials						
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	$309.67	1	$309.67
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$11.96	48	$574.08
Pipe, PVC, 8", SDR 35	994	Materials: - 8" - PVC - SDR 35 - ASTM D3034	Foot	$6.72	40	$268.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$180.58	1	$180.58

Practice: 587 - Structure for Water Control

Scenario: #10 - Inline WCS, Subsurface Drainage Control, >10 in. dia. Pipe

Scenario Description:

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through a control structure which is operated with stoplogs. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil. This retention time allows nutrients to be reduced by bacteria such that the nutrients do not leave with the water. A single stoplog structure may have its influence extended by buried float-activated structures which can be counted as structures also for a separate payment. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

Before Situation:

The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

After Situation:

The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile removes nutrients. Typical affected area for a single structure is 10-20 acres. A single structure with stoplogs may have its influence extended by use of buried float-activated control structures, which may be paid for as separate structures also.

Scenario Feature Measure: Number of Structures

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $2,244.17 **Scenario Cost/Unit:** $2,244.17

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$58.80	3	$176.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$36.46	3	$109.38
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	2	$44.62
Materials						
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$11.96	72	$861.12
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	$309.67	1	$309.67
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.48	380	$562.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$180.58	1	$180.58

Practice: 587 - Structure for Water Control

Scenario: #12 - Straight Pipe, Surface Water Control, <=10 in. dia. Pipe (w/o adjustable control)

Scenario Description:

Used as an outlet for Wetland; no drop box; straight through 10" diameter PVC pipe; pipe is backfilled with #57 stone to 1' over the top of the pipe; 12" thick layer of Type D riprap is placed at the outlet end with 6" thick of #57 stone under it.

Before Situation:

The landowner wishes to establish a wetland area to provide habitat for fish and wildlife.

After Situation:

A straight pipe (principal spillway) is installed through an earth embankment to create a wetland. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Feet of pipe installed

Scenario Unit: Foot

Scenario Typical Size: 30

Scenario Cost: $1,294.49 **Scenario Cost/Unit:** $43.15

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$58.80	5	$294.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	5	$111.55
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$27.55	5	$137.75
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$25.33	5	$126.65
Pipe, PVC, 10", SDR 35	1251	Pipe, PVC, SDR 35, 10" Diameter - ASTM D3034. Material cost only.	Foot	$10.52	30	$315.60
Rock Riprap, graded, angular, material only	2131	Graded Rock Riprap for 12" to 24" size ranges. Includes material costs only. Shipping not inlcuded.	Ton	$20.23	2	$40.46
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$268.48	1	$268.48

Practice: 587 - Structure for Water Control

Scenario: #13 - Straight Pipe, Surface Water Control, >=12 in. dia. Pipe (w/o adjustable control)

Scenario Description:

Used as an outlet for Wetland; no drop box; straight through 12" diameter PVC pipe; pipe is backfilled with #57 stone to 1' over the top of the pipe; 12" thick layer of Type D riprap is placed at the outlet end with 6" thick of #57 stone under it.

Before Situation:

The landowner wishes to establish a wetland area to provide habitat for fish and wildlife.

After Situation:

A straight pipe (principal spillway) is installed through an earth embankment to create a wetland. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Feet of pipe installed

Scenario Unit: Foot

Scenario Typical Size: 30

Scenario Cost: $1,528.14 **Scenario Cost/Unit:** $50.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$58.80	5	$294.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$27.55	5	$137.75
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$22.31	5	$111.55
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$25.33	6	$151.98
Rock Riprap, graded, angular, material only	2131	Graded Rock Riprap for 12" to 24" size ranges. Includes material costs only. Shipping not inlcuded.	Ton	$20.23	2	$40.46
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.48	354	$523.92
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$268.48	1	$268.48